Curriculum Vitæ

Philipp Hennig

Date of birth: 7th of July, 1980
Place of birth: Ludwigsburg, Germany
Nationality: German
Phone: +49 176 2391 9501
Email: philipp.hennig@gmail.com

Address:
Hirschgasse 7
72070 Tübingen, Germany

Education & Career

Max Planck Institute for Intelligent Systems, Tübingen, Germany – Department of Empirical Inference

03 / 2013 – current: Group Leader, research group *Elementary Intelligence*

07 / 2011 – 03 / 2013: Research Scientist

03 / 2011 – 06 / 2011: Max Planck Postdoc Scholar

11 / 2010 – 01 / 2011 Engineering Department, University of Cambridge, UK
Visiting Researcher; Computational and Biological Learning Laboratory

2008 – 2010 Microsoft Research Ltd., Cambridge External Consultant

07 / 2008 – 10 / 2008 Microsoft Research Ltd., Cambridge Research Intern

10 / 2007 – 11 / 2010 Cavendish Laboratory and Robinson College, University of Cambridge, UK
PhD in Physics. Title: *Approximate Inference in Graphical Models*. Supervisor: David J C MacKay
viva voce defence on 11 Jan 2011 (accepted without corrections), graduated 30 April 2011.

05 / 2007 – 07 / 2007 McKinsey & Company, Berlin, Germany Summer Associate

04 / 2006 – 04 / 2007 Max Planck Institute for Medical Research, Heidelberg, Germany
Diplom-thesis [German 5-year degree, roughly equivalent to MSc level]. Supervisor: Winfried Denk
Title: *Point-Spread Functions for backscattered imaging in the Scanning Electron Microscope*.

10 / 2001 – 03 / 2007 Faculty of Physics, University of Heidelberg, Germany
studies towards the *Diplom* degree in physics. Graduated March 2007
overall grade point average 1.1 on German university scale from 1.0 (best) to 4.0 (worst)

10 / 2004 – 06 / 2005 Department of Physics, Imperial College, London, UK
Participation in the theoretical physics MSc "Quantum Fields and Fundamental Forces" as an Erasmus exchange student. 75% grade point average in final examinations, 'Imperial College International Diploma' awarded 11/2005. Erasmus students generally cannot be awarded degrees, but I passed all necessary examinations for the MSc degree

07 / 2000 – Christoph Schrempf Gymnasium, Besigheim, Germany *Abitur* (A-Levels). Grade point average 1.3 on German school scale from 1.0 (best) to 6.0 (fail)

Peer-Reviewed Publications (chronological)

In machine learning, conferences have similar standing, and are similarly competitive as journals. The two flagship conferences are NIPS (impact factor 2.7) and ICML (impact factor 6.1), which each have about 25% acceptance rates. The most prominent journal is JMLR (27% acceptance rate, impact factor 5.9 in 2004).

under review

- J.P. Cunningham, P. Hennig, S. Lacoste-Julien — **Integrating Gaussians with Expectation Propagation**
  under review by the *Journal of Machine Learning Research*, preprint at arxiv:1111.6832
- R. Garnett, M. Osborne, P. Hennig — **Active Learning of Linear Embeddings for Gaussian Processes**
  under review by *Neural Information Processing Systems* 2013
- D. Lopez-Paz, P. Hennig, B. Schölkopf — **The Randomized Dependence Coefficient**
  under review by *Neural Information Processing Systems* 2013, preprint at `http://arxiv.org/abs/1304.7717`

- P. Hennig, S. Hauberg — **Probabilistic Numerical Analysis in Riemannian Statistics**
  under review by *Neural Information Processing Systems* 2013, preprint at `http://arxiv.org/abs/1306.0308`
- F. Meier, P. Hennig, S. Schaal — **Local Gaussian Regression**
  under review by *Neural Information Processing Systems* 2013

published

- E. Klenske, M. Zeilinger, B. Schölkopf, P. Hennig — **Nonparametric dynamics estimation for time periodic systems**
  Proc. of the 51st Annual Allerton Conference on Communication, Control, and Computing, 2013 (in press).
- M. Bangert, P. Hennig, U. Oelfke — **Analytical probabilistic modeling for radiation therapy planning**
  Physics in Biology and Medicine 2013 (in press)
- M. Bangert, P. Hennig, U. Oelfke — **Analytical probabilistic proton dose calculation and range uncertainties**
  International Conference on the Use of Computers in Radiation Therapy, 2013 (in press)
- P. Hennig, M. Kiefel — **Quasi-Newton Methods – A New Direction**
  (extended version of published ICML paper below) *Journal of Machine Learning Research*, **14**(Mar): 807–829, 2013
- P. Hennig — **Fast Probabilistic Optimization from Noisy Gradients**
  International Conference on Machine Learning (ICML), 2013
- P. Hennig, M. Kiefel — **Quasi-Newton Methods – A New Direction**
  International Conference on Machine Learning 2012
- P. Hennig, C. Schuler — **Entropy Search for Information Efficient Global Optimization**
  Journal of Machine Learning Research, **13**(Jun): 1809–1837, 2012
- ▷ B. Bócsi, P. Hennig, L. Csató, J. Peters — **Learning Tracking Control with Forward Models**
  International Conference on Robotics and Automation 2012
- P. Hennig, D. Stern, R. Herbrich, T. Graepel — **Kernel Topic Models**
  Artificial Intelligence and Statistics 2012
- P. Hennig — **Optimal Reinforcement Learning for Gaussian Systems**
  Advances in Neural Information Processing Systems 2011
- P. Hennig — **Approximate Inference in Graphical Models**
  PhD thesis, University of Cambridge
- Bangert, M., Hennig, P., Oelfke, U. — **Using an infinite von Mises-Fisher Mixture Model to Cluster Treatment Beam Directions in External Radiation Therapy**
  International Conference on Machine Learning and Applications, 2010
- P. Hennig, D. Stern, T. Graepel — **Coherent Inference on Optimal Play in Game Trees**
  Artificial Intelligence and Statistics, and Journal of Machine Learning Research W&CP **9**, 2010
- P. Hennig, D. Stern, T. Graepel — **Bayesian Quadratic Reinforcement Learning**
  workshop poster at *Neural Information Processing Systems*, 2009
- Hennig, P. — **Expectation Propagation on the Maximum of Correlated Normal Variables**
  Technical Report, arXiv:0910.0115, 2009
- P. Hennig, W. Denk — **Point-spread functions for backscattered imaging in the scanning electron microscope**
  Journal of Applied Physics **102**, 123101 (2007)

Patents

- P. Hennig, D. Stern, T. Graepel, R. Herbrich — **Topic Models (Application)**, patent application filed by Microsoft Research Ltd. on 10/26/2010, serial number 12/912428. US patent number 20120101965; published on 26 April 2012.

Teaching

Graduate Student Supervision

- Maren Mahsereci, MPI Tübingen (PhD)

- Edgar Klenske, Uni Stuttgart / MPI Tübingen (*Diplom* & PhD Theses)

Winter Terms 2012/13 and 2013/14 Lecture course "Intelligent Systems I" (2+2 SWS) at the Eberhard-Karl University of Tübingen as an external lecturer (*Lehrauftrag*). Jointly with Stefan Harmeling.

Summer Term 2012 Co-Organizer, Seminar "Learning Robots", Technical University Darmstadt, Germany

29/3/2012 Invited 1-day course, "Spring School on Human Modelling", Ludwig-Maximilian University Munich, Germany

Winter Term 2011/12 Co-Organizer, Seminar "Autonomous Learning Systems", Technical University Darmstadt

academic years 2007/08, 08/09 Supervisor for 9 students (in groups of 2 or 3) in the advanced physics track (Physics A and B) of part 1B of the Natural Science Tripos at the University of Cambridge, Robinson College (Classical Dynamics, Thermodynamics, Fluid Dynamics, Electrodynamics)

Summer Term 2003 Teaching Assistant for the first-year course in Calculus; Faculty of Mathematics, University of Heidelberg

Community

Conferences, Workshops & Summer Schools

- *Machine Learning Summer School (MLSS)*, Tübingen, 2013. principal organizer
- *NIPS workshop on Probabilistic Numerics*, Lake Tahoe, US, 8 December 2012: co-organizer
- *Machine Learning Summer School*, La Palma, Spain, 2012: local arrangements chair

Contributed Reviews for

- Journal of Machine Learning Research (JMLR, MIT Press) – Member of the Editorial Board
- Neural Information Processing Systems (NIPS)
- International Conference for Machine Learning (ICML)
- Artificial Intelligence and Statistics (AISTATS)
- Uncertainty in Artificial Intelligence (UAI)
- Conference on Learning Theory (COLT)
- Mathematical Programming A
- Robotics: Science and Systems (R:SS)
- Machine Learning Summer School (MLSS)
- European Workshop on Reinforcement Learning (EWRL)
- Microsoft Research European PhD scholarship programme
- Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO, Dutch funding body)
- Data Mining and Knowledge Discovery (Springer Journal)

Outreach

- principal organizer for a weekend seminar on *probability and uncertainty* for gifted high-school students, in collaboration with the Heidelberg Life Science Lab. March 2013
- co-founded the *Cambridge University Statistics Clinic* at the Centre for Mathematical Sciences, in Michaelmas 2009, which aims to help non-statisticians from all academic fields make more of their data. `http://www.statslab.cam.ac.uk/clinic/`

Student Representation

- student delegate to the Faculty Council and the Board of Graduate Studies at Heidelberg (2 terms), 2003/04/05
- President of Robinson College Graduate Student Association (MCR) in 2009/10

Invited Talks & Visits (excluding conference presentations)

- Gaussian Process Summer School, University of Sheffield, 2013
- École Polytechnique Fédérale de Lausanne, 2013
- Hausdorff Center for Mathematics, Bonn, 2013

- Max Planck Institute for Neurobiology, Munich, 2012
- Spring School on Human Modeling, Ludwig-Maximilian University Munich, 2012
- Heidelberger Life-Science Lab, 2012
- Technical University Darmstadt, Intelligent Autonomous Systems Lab, Oberseminar, 2011, 2012
- German Cancer Research Centre Heidelberg, Physical Models group, 2011
- University College London, Gatsby Computational Neuroscience Unit, 2011
- Cambridge University, Computational Biological Learning Group, 2011
- Microsoft Research Cambridge Ltd., 2011

Funding Attracted (excluding scholarships & awards)

- 47,000 € Max Planck Grassroots grant for a follow up on *Nonparametric Modeling for Collective Cell Migration Dynamics* (see below).
- 4,000 € funding for the NIPS workshop on *Probabilistic Numerics* (see "Workshops" above) by the ERC integrated project, the "PASCAL framework"
- 30,000 € Max Planck Grassroots grant for *Nonparametric Modeling for Collective Cell Migration Dynamics*, with Heike Böhm, University of Heidelberg
- 7,500 € Max Planck Grassroots grant for *Multidimensional, Transductive Inference in Electron Microscopy*, with Peter v.Aken, Wilfried Sigle, Stefan Harmeling, MPI for Intelligent Systems, Stuttgart

Selected Scholarships & Awards

03 / 2011 – 06 / 2011 Max Planck Postdoc Scholarship
Max Planck Society (MPI for intelligent Systems)

10 / 2007 – 10 / 2010 Microsoft Research PhD Scholarship
Competitive PhD scholarship (20 places awarded throughout Europe). Total value £66,000

since 10 / 2007 Honorary Scholar of the Cambridge European Trust
Originally including partial PhD funding (declined), subsequently changed to honorary status

07 / 2005 Lindau Nobel Laureate Meetings, student stipend
Competitive travel stipend (11,000 applicants / 500 places) for the annual meeting of Laureates

References

Prof. Bernhard Schölkopf
Director
MPI for Intelligent Systems
Spemannstraße 38
72076 Tübingen, Germany
sabrina.rehbaum@tue.mpg.de

Prof. David J.C. MacKay
Chief Scientific Advisor
Dpt. of Energy and Climate Change
3 Whitehall Place
London SW1A 2HD, UK
csa@decc.gsi.gov.uk

Prof. Zoubin Ghahramani
Prof. of Information Engineering
University of Cambridge
Trumpington Street
Cambridge CB2 1PZ, UK
zoubin@eng.cam.ac.uk